WHAT IS CLAIMED IS:

1. A method of making translucent matrix arrays comprising:

a) coating a substrate with a translucent layer of nitrocellulose, rayon or cellophane; and

b) attaching one or more first probes to the translucent layer.

2. The method of claim 1, wherein the nitrocellulose is colloidal nitrocellulose.

3. The method of claim 1, wherein the substrate is glass or nylon.

4. The method of claim 1, wherein the first probes are selected from the group consisting of antibodies, antibody fragments, FAb fragments, humanized antibodies, single-chain antibodies, chimeric antibodies, oligonucleotides, polynucleotides, nucleic acids, aptamers and affibodies.

5. The method of claim 1, wherein the matrix array is reconfigurable.

6. The method of claim 5, wherein the first probes are aptamers or affibodies.

7. The method of claim 6, wherein the first probes bind to IgG (immunoglobulin G).

8. The method of claim 1, further comprising allowing the first probes to bind to one or more targets.

9. The method of claim 8, further comprising binding tagged second probes to the targets.

10. A translucent matrix array made by a method comprising:

a) coating a substrate with a translucent layer of nitrocellulose, rayon or cellophane; and

b) attaching one or more first probes to the tranlucent layer.

11. The translucent matrix array of claim 10, wherein the first probes are attached to the array in spots of about 300 μm in size.

12. A method of identifying targets using reconfigurable matrix arrays comprising:

a) attaching small linker molecules to a matrix array surface;

b) allowing one or more targets to bind to one or more first and second probes in an aqueous solution;

c) allowing said first probes to bind to the small linker molecules; and

d) detecting the presence of tagged second probes attached to the matrix array surface.

13. The method of claim 12, wherein the second probes that bind to different targets are distinguishably labeled.

14. The method of claim 12, wherein the small linker molecules are aptamers or affibodies.

15. The method of claim 14, wherein the small linker molecules bind to IgG.

16. The method of claim 15, further comprising: (i) using said array to detect a first target; (ii) washing said array to remove said first target; and (iii) using said array to detect a second target.

17. The method of claim 16, further comprising using said array to detect a multiplicity of targets.

18. The method of claim 17, wherein said targets are detected sequentially.

19. A method of data analysis comprising:
capturing a plurality of calibration images using an imager, the imager comprising a plurality of pixels;
obtaining a plurality of pixel signals for each of the plurality of calibration images;
creating an average interpolation function to produce interpolated average signal values for the imager; and
creating an interpolation function for each pixel to produce interpolated signal values for the pixel.

20. The method of claim 19, wherein each of the plurality of calibration images is at a different exposure level.

21. The method of claim 19, wherein the exposure levels for the calibration images are spaced evenly over a range of exposure levels.

22. The method of claim 19, wherein the average interpolation function and the interpolation function for each pixel are based on linear interpolation.

23. The method of claim 19, further comprising:
capturing a test image at a test exposure level;
obtaining a plurality of pixel signals for the test image; and
producing a plurality of corrected pixel signal values for the test image.

24. The method of claim 23, wherein producing the plurality of corrected signal values for the test image comprises multiplying each of the plurality of pixel signals by the average interpolation function for the imager divided by the interpolation function for the pixel.

25. The method of claim 23, further comprising producing a plurality of leveled signal values for the plurality of corrected signal values.

26. The method of claim 25, wherein producing the plurality of leveled signal values for the plurality of corrected signal values comprises:
producing a histogram of the plurality of corrected signal values;
determining a high threshold and a low threshold for the histogram; and
determining leveled signal values based on comparisons between the corrected test signals and the high threshold and low threshold.

27. The method of claim 26, further comprising setting a leveled signal value for a pixel to zero if a corrected test signal value for the pixel is less than the low threshold.

28. A machine-readable medium having stored thereon data representing sequences of instructions that, when executed by a processor, cause the processor to perform operations comprising:
receiving a plurality of pixel signal values for each of a plurality of calibration images captured by an imager;
creating an average interpolation function to produce interpolated average signal values for the imager; and

creating an interpolation function for each pixel to produce interpolated signal values for the pixel.

29. The medium of claim 28, further comprising instructions that, when executed by the processor, cause the processor to perform operations comprising:

producing leveled signal values for the plurality of corrected signal values.

30. The medium of claim 29, wherein producing leveled signal values for the plurality of corrected signal values comprises:

producing a histogram of the corrected signal values;

determining a high threshold and a low threshold for the histogram; and

determining leveled signal values based on comparisons between the corrected test signals and the high threshold and low threshold.

31. The medium of claim 30, further comprising instructions that, when executed by the processor, cause the processor to perform operations comprising:

setting a leveled signal value for a pixel to a depth value for the imager multiplied times a difference between the corrected test signal for the pixel and the low threshold and divided by a difference between the high threshold and the low threshold if the corrected signal value for the pixel is greater than or equal to the low threshold and less than or equal to the high threshold.

32. A total optical assay device comprising:

a light-tight casing with a lid;

a stage below the lid, the stage to hold slides or microtiter well plates;

a focusing lens below the stage;

an imaging device below the lens, the imaging device arranged to obtain optical images of slides or microtiter well plates on the stage;

a base to hold the imaging device in position; and

a cooling device.

33. The device of claim 32, further comprising a machine readable medium according to claim 28.

34. An optical assay device comprising:

a circular disk to fit into a well of a microtiter plate;

a probe-binding membrane attached to the bottom of the disk;

a stem attached to the top of the disk; and

a handle attached to the top of the stem.

35. The device of claim 34, wherein the membrane is rayon, cellophane or translucent nitrocellulose.

36. The device of claim 34, further comprising a multiplicity of spots bound to the lower surface of the membrane.

37. An optical assay device comprising:

a nylon slide;

a translucent nitrocellulose layer attached to the upper surface of the slide; and

a multiplicity of spots bound to the upper surface of the translucent nitrocellulose layer.